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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,982	10/14/2003	James M. Fenton	30471.59100 DIV	4721

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Edwards & Angell LLP
301 Tresser Blvd.
Stamford, CT 06901

EXAMINER	
HODGE, ROBERT W	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/684,982	FENTON ET AL.	
	Examiner	Art Unit	
	Robert Hodge	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 14 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 5/10/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6-7 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 6 is of the dependent form and depends from itself; therefore it is impossible to determine what the applicants' invention is. And because claim 7 depends from claim 6 the same deficiency exists.

4. Claim 14 does not recite which part of the MEA is supposed to have the specific ionomeric content.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-21 and 28-31 are rejected under 35 U.S.C. 102(b) as being unpatentable by Imahashi et al. U.S. Patent No. 5,350,643 hereinafter referred to as Imahashi et al.

7. Imahashi et al. teaches a composite membrane used in a fuel cell having two surfaces with a membrane layer comprising an ionically conductive solid and an ionomeric binder and a protective layer comprising the other layer comprises an ionically conductive solid and an ionomeric binder (Abstract and column 3, lines 28 et seq.). Imahashi et al. also teaches anodes and cathodes having catalyst layers thereon as well as comprising an ionomeric binder (being a proton conducting ionomer comprise of perfluorosulfonic acid (Example 1)) and ionically conductive solid, and that the anodes and cathodes are in contact with one surface of the membrane (Abstract and column 3, lines 28 et seq.). Imahashi et al. further teaches the use of collectors being of a porous material in contact with the anode and/or cathode (Abstract and column 3, lines 28 et seq.). The examiner notes that since no specific definition has been giving for "collectors", many different parts of the MEA read on the claims as recited and since Imahashi et al. discloses materials that are inherently porous both claim limitations for the collectors are met.

8. Imahashi et al. teaches that the amount of ionomeric binder content for the anode and the cathode be between 10% and 100% by volume (column 4, lines 35 et seq. Examples 1-3 and claims 3-4). The examiner notes that the amounts disclosed by Imahashi et al. are in weight % not volume %, however the examiner has reason to believe that the weight % disclosed will most definitely fall into the ranges recited by applicants. Especially given the large range of volume % recited by applicants. Imahashi et al. also teaches that the catalyst amount for the anode and cathode be between 20% and 60% or 20% and 40% by weight respectively (Examples 1-3 and

claims 3-4 and 7). And that the catalyst loading for the anode and cathode be between 0.05 and 5 mg/cm^2 (Example 1). Imahashi et al. further teaches that the catalyst be supported on carbon (column 4, line 5).

9. The recitation "and optionally hygroscopic fine powder" in claim 1 has been given little or no patentable weight, since there is no positive recitation set forth that such a powder must exist in the structure of the layer as recited. However Imahashi et al. teaches that the proton conductor is hydrophilic, which is the same property by definition as hydroscopic. Therefore the aforementioned limitation of claim 1 has been met as so recited.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imahashi et al. in view of Surampudi et al. U.S. Patent No. 6,248,460 hereinafter referred to as Surampudi et al. and Murphy et al. U.S. Patent No. 6,059,943 hereinafter referred to as Murphy et al.

12. Imahashi et al. teaches everything disclosed in the above 102 rejection.

13. Imahashi et al. does not teach that the ionically conductive solid in contact with the anode or the cathode be a heteropoly acid, nor that said heteropoly acid be: phosphotungstic acid, phosphomolybdic acid or zirconium hydrogen phosphate.

14. Surampudi et al. teaches the use of zirconium hydrogen phosphate as a proton-conducting additive (column 4, lines 31-34).

15. Murphy et al. teaches the use of 12-phosphotungstic acid as an additive to the membrane (column 6, line 67) as well as heteropolytungstates, heteropolymolybdates and zirconium phosphates (column 8, lines 57-58).

16. It would have been obvious to include in Imahashi et al. the specific chemical additives disclosed by Surampudi et al. and Murphy et al. in order to improve water retention as well as increase proton conductivity at temperatures higher than 100°C (as disclosed by Murphy et al. (column 7, lines 2-4)).

17. Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imahashi et al. in view of Banerjee U.S. Patent No. 5,795,668 hereinafter referred to as Banerjee.

18. Imahashi et al. teaches everything disclosed in the above 102 rejection.

19. Imahashi et al. does not teach the use of the MEA in an electrolysis cell, nor the use of the MEA in a fuel cell in a vehicle or an electromechanical system.

20. Banerjee teaches the use of fuel cells in motor vehicles (column 2, line 35) and that membranes can be used for electrolysis (column 2, line 47).

21. It would have been obvious to include in Imahashi et al. that the membrane be used for electrolysis, in a fuel cell in a vehicle or an electromechanical system provided

by Banerjee in order to provide commonly and widely known applications of membranes. The examiner notes that a motorized vehicle is an electromechanical system.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Reissued Patent No. RE37,701 to Bahar et al., teaches a composite membrane with a base material and an ion exchange resin

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Hodge whose telephone number is (571) 272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RWH 1-18-05

MICHAEL BARR
SUPERVISORY PATENT EXAMINER